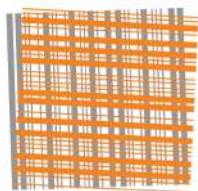


DOCSIS SOLUTIONS



NETWORK
M A N A G E R

PATRON

by NETWORK MANAGER

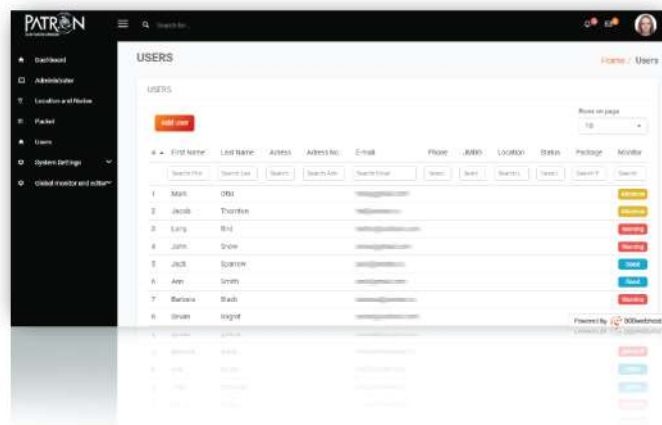
PATRON is proprietary subscriber administration and network monitoring software developed by Network Manager.

PATRON is modular solution which enables software modules to be adjusted according to the needs which makes it cost effective solution for every ISP.

Modules are GPON, DOCSIS, VOIP, PPPoE.



This software, besides subscriber/modem identity verification and registration, performs efficient administration of users, monitors end user device, graphic view. It also simplifies creation of individual and bundled services (analog television, digital television, internet packages, VoIP packages, IPTV, etc.) and network monitoring (graphic representations of network performances).

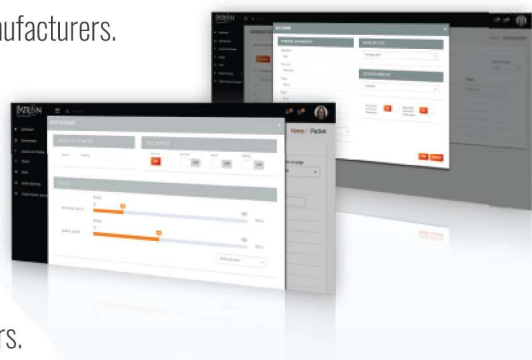


Patron provisioning DOCSIS module enables administration and management of DOCSIS devices. All the current DOCSIS standards are supported by PATRON, as are all the services required for complete provisioning such as DHCP, DNS, TFTP, and Time Server. Interactive charts, modem firmware update, automatic package extension... all features are Key requirements for scalability, reliability, and responsiveness of the PATRON software.

DOCSIS module enables:

- ▶ Allows creation of profiles in OLT.
- ▶ Allows you to create different subscription offers.
- ▶ Allows the registration of different ONTs from different manufacturers.
- ▶ Automatic provisioning by TR69.
- ▶ Automatic ONT configuration.
- ▶ Built-in DHCP server.
- ▶ Remote administration to client ONTs.
- ▶ ONT and OLT parameter statistics and monitoring.
- ▶ Open communication API for linking billing programs.
- ▶ Automatic ONT's shutdown.
- ▶ Easily generates your tariff packages to offer your customers.

And much more....



CMTS

With its long-term presence in the market when it comes to providing equipment for cable operators, Network Manager has acquired significant references related to internet providing on existing HFC networks which are being used for distribution of television signal.

INTEGRATED CMTS

In small to medium systems, simplicity of Integrated CMTS represents big advantage. I-CMTS is more attractive to cable providers with smaller number of subscribers.

Integrated CMTS systems, or I-CMTS, besides CMTS platform, include our proprietary provisioning software – Patron, and EuroDOCSIS 3.0 modems.

The architecture of the I-CMTS system contains all the necessary components in a single chassis. This concept does not require additional devices, which provides much simpler RF combining in the headend. The advantages of this system are simplicity, reduced number of points of failure, easier maintenance, and lower costs. However, I-CMTS can be modified into the M-CMTS system by simply adding M-CMTS elements, such as corresponding line cards, DTI server and EdgeQAM device.

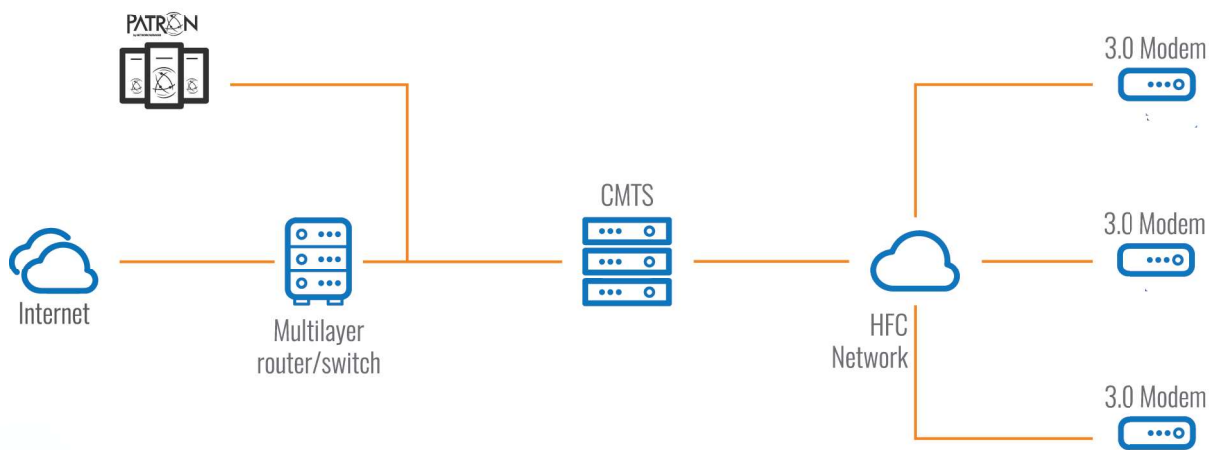
The DOCSIS system provides bidirectional transmission of IP traffic between the cable system headend and end-user's location, over an coaxial or hybrid-fiber/coax (HFC) cable network.

Internet Providing in HFC Network I-CMTS, EuroDOCSIS 3.0

DOCSIS 3.0 features channel bonding, which enables multiple downstream and upstream channels to be used together at the same time by a single subscriber.

One I-CMTS chassis supports up to fourteen line cards. Single line card provides up to 48 channels for both, downstream and upstream, by EuroDOCSIS 3.0 standard, which means that fully equipped I-CMTS chassis supports up to 384 downstream channels, and 288 upstream channels. This solution provides maximum downstream capacity of 1,2 Gbps (by using 24-channel bonding,) and maximum upstream capacity of 200 Mbps (by using 8-channel bonding), per subscriber.

I-CMTS solutions



Throughput of whole chassis in downstream is up to 21 Gbps, and for upstream it amounts to 8,6 Gbps.

CMTS

MODULAR CMTS

In the last few years, Modular CMTS (M-CMTS) systems have gained momentum, especially among cable providers with larger number of subscribers and those which have multiple services run within their networks (VoIP, DVB-C, IPTV, VoD, etc).

M-CMTS systems we commonly implement are based on CMTS platform, EdgeQAM modulator, our proprietary provisioning software – Patron, and EuroDOCSIS 3.0 and cable modems.

CMTS chassis can be modular or fixed configuration. Modular chassis means that full redundancy (power supply, processors, line cards) and scalability are allowed, so it's individual elements can be added or replaced according to customer's needs for system's enhancements. In large systems, modularity which enables M-CMTS is of great significance.

CMTS is the system's core and its downstream capacity is increased by using EdgeQAM modulator. In order to perform properly, temporal synchronization of these two devices is necessary, and it is achieved by DTI server. In this way, not only is the total downstream speed increased, but the speed to each individual subscriber as well (by using 3-, 4-, 8-, 16-, 24- channel bonding EuroDOCSIS 3.0 modems).

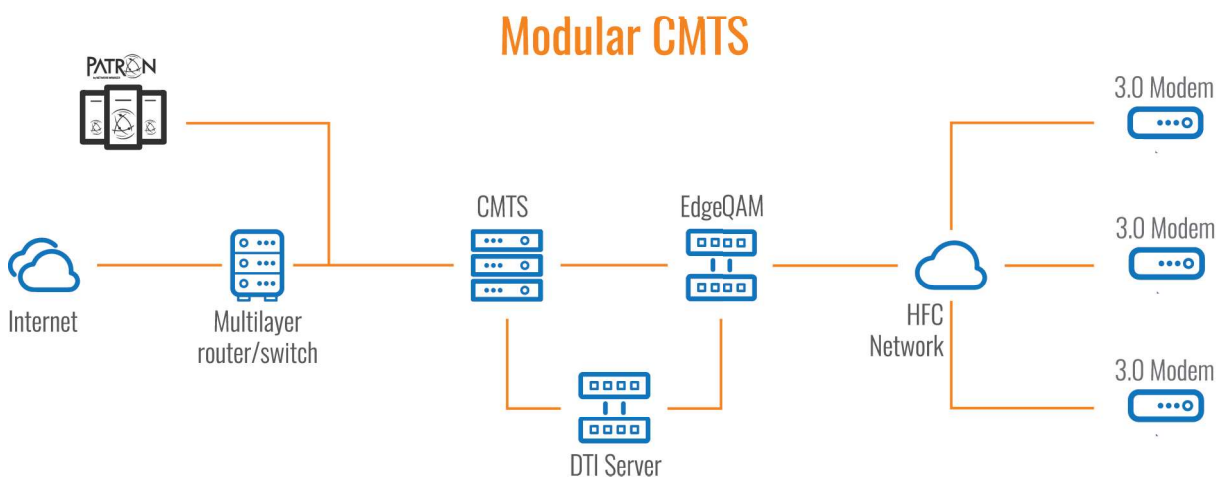
The DOCSIS system allows transparent bidirectional transfer of Internet protocol (IP) traffic, between the cable system head-end and customer locations, over an all-coaxial or hybrid-fiber/coax (HFC) cable network. DOCSIS 3.0 features channel bonding, which enables multiple downstream and upstream channels to be used together at the same time by a single subscriber.

Internet Providing in HFC Network M-CMTS, EuroDOCSIS 3.0

Modular CMTS system is implemented within more complex systems which demand large aggregation of traffic and multiple services (data, voice, video).

One M-CMTS chassis supports up to eight line cards. Single line card provides up to 54 downstream channels and 60 upstream channels, by EuroDOCSIS 3.0 standard, which means that fully equipped M-CMTS chassis supports up to 432 downstream channels and 480 upstream channels.

M-CMTS, in combination with external EdgeQAM and DTI server, provides maximum downstream capacity of 1,2 Gbps (by using 24-channel bonding) and maximum upstream capacity of 200 Mbps (by using 8-channel bonding), per subscriber. Throughput of whole chassis in downstream is up to 24 Gbps, and for upstream it amounts to 14 Gbps.



Cable Modems

Important element of internet providing system implementation is EuroDOCSIS 3.0 modems. Depending on available services, we handle 4 types of them:

- ▶ Data only
- ▶ Data + EMTA (Voice)
- ▶ Data + WiFi
- ▶ Data + EMTA + WiFi



Cable modems allow different types of bonding. EuroDOCSIS modems support 27 Mbps in reverse and 50 Mbps directly per channel, with 32x8 channel bonding of EuroDOCSIS 3.0 modems, maximum bandwidth is 200 Mbps upstream and 1,2 Gbps downstream.

About Us

More than 10 years in designing and offering solutions and working with ISP proves Network Manager to be one of the leading system integration companies in this part of the world.

More than 100 installed CMTS, GPON solutions and cooperation with the leading Internet providers sets Network Manager apart as a firm with a constant growth and expansion to the markets across the world.

It's a long list of our satisfied clients and users of the solutions that Network Manager offers, Kopernikus, AVACOM, Jotel, IKOM, Invest, just to name a few.

We take great pride in offering our proprietary provisioning and administration software PATRON that rounds off services for DOCSIS, GPON, VoIP and Wireless. Patron is the best in class provisioning software that allows automatic registration of devices and efficient administration of its subscribers.

Patron is a modular platform that provides in the same system, GPON and Docsis devices of different vendors work simultaneously.

Network Manager provides a range of service offerings, including technical support into the various IT categories.





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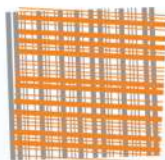
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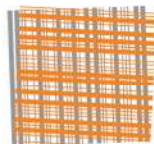
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